

**AUTHORIZATION FOR A NO-DISCHARGE WATER PERMIT UNDER THE  
ARKANSAS WATER AND AIR POLLUTION CONTROL ACT**

In accordance with the provisions of the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 *et seq*) and Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation No. 17

**Great Lakes Chemical Corporation – A Chemtura Company**  
**2226 Haynesville Highway**  
**P.O. Box 7020**  
**El Dorado, AR 71730**

is authorized to operate the Underground Injection Control Class I hazardous waste injection wells at the following locations, approximately 3.8 miles and 3.7 miles southwest of El Dorado in Union County, Arkansas:

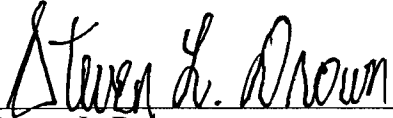
<b>Well</b>	<b>Location</b>
WDW-5 Central	Section 2, Township 18 South, Range 16 West Latitude: 33° 10' 46" North Longitude: 92° 43' 29" West
WDW-6 Central	Section 11, Township 18 South, Range 16 West Latitude: 33° 10' 34" North Longitude: 92° 43' 7" West

The facilities are located at least 323 feet and 556 feet from a tributary to Dry Creek in Stream Segment 2E of the Ouachita River basin.

Operation shall be in accordance with all conditions set forth in this permit. In accordance with Part II.C, the permittee must reapply for permit coverage at least 180 days prior to the expiration date.

Effective Date: July 1, 2012

Expiration Date: June 30, 2022

  
\_\_\_\_\_  
Steven L. Drown  
Chief, Water Division  
Arkansas Department of Environmental Quality

  
\_\_\_\_\_  
Issuance Date:

**PART I  
SPECIFIC CONDITIONS**

**1. OPERATIONAL REQUIREMENTS**

A. This permit is for the operation of the Underground Injection Control (UIC) Class I hazardous waste injection wells, Waste Disposal Well (WDW)-5 Central and WDW-6 Central.

B. Waste shall not be discharged from this operation to the waters of the State or onto the land in any manner that may result in runoff to the waters of the State.

C. Reconstruction, Recompletion, or Modification

Any reconstruction, recompletion, or modification of the injection facilities shall be done in accordance with the plans and specifications submitted with the permit application and the well completion report. Any proposed changes to the construction and operation of the wells, prior to implementation, must be submitted in writing to and approved by the Department as providing protection equivalent to or greater than the existing construction and operation.

D. Formations Permitted for Injection

Fluids disposed into the WDW-5 Central and WDW-6 Central wells shall be injected into the following specific permitted injection intervals as listed below. No other injection intervals, unless specified herein, shall be authorized for fluid disposal at this time.

Well	Injection Interval	Injection Depth
WDW #5	Hosston Formation	3,775 feet -- 5,130 feet ft bkb
WDW #6	Hosston Formation	3,828 feet - -5,200 feet ft bkb

kb = kelly bushing (20.2 feet above ground level for WDW #5 and 20.5 feet above ground level for WDW #6)

E. Authorization of Specific Injection Intervals

The Permittee shall receive authorization from the Department to inject fluids into the specific injection intervals as described in Part I.A.4. of this permit. Fluid disposal into permitted injection intervals other than those authorized by the Department in Part I.A.4. of this permit shall be considered unauthorized injection, a violation under 40 CFR §144.11 and shall subject the Permittee to possible enforcement action.

F. Casing and Cementing

The well shall be cased and cemented as necessary to prevent the movement of fluids into or between underground sources of drinking water (USDWs), in accordance with 40 CFR §144.12(a). The cement and casing used in WDW-5 Central and WDW-6 Central shall be designed for the life expectancy and closure period of the wells and in compliance with 40 CFR §146.12(b).

G. Waste Stream

- 1) The Permittee is authorized to inject only the waste stream with the parameters and typical analysis as described in the permit application.
- 2) Effluent for injection must be over 99 percent water with only trace amounts of brominated organic compounds and is limited to the following:
  - a) recovered ground water from operations at the Central Plant,
  - b) the debrominated brine waste stream from the production of bromine and organic and inorganic chemicals and from other activities related to maintenance, storage, transportation and support necessary for such operations,
  - c) fluids from spill remediation of the brine waste stream,
  - d) wastewater generated from a series of recovery wells drilled to recover shallow ground water beneath the Central Plant site,
  - e) leachates from the North/South Landfill and RCRA cell 1 and soil vapors extracted from the railroad loading area which are collected, treated, and routed to the designated storage area located at the process water treatment plant.
- 3) The pH of the injected waste must range from 4.0 s.u. to 10.0 s.u.
- 4) The Permittee must use analytical methods in accordance with 40 CFR §144.28(g), to accurately obtain an analysis of the waste stream, with acceptable Detection Limits (DL) or Practical Quantitation Limits (PQL).
- 5) Wastes not authorized to be processed, disposed, or otherwise managed as stipulated in this permit are not authorized for injection.

H. Operational Requirements

In accordance with 40 CFR §146.13(a), operating requirements shall specify that the injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure that the pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures within the injection zone.

- 1) Injection shall be through tubing with a packer(s). Injection between the casing and the wellbore is prohibited.
- 2) The Permittee shall maintain a fluid-filled annulus. The fluid shall be noncorrosive, or contain a corrosion inhibitor. If nitrogen is used to pressure up the annulus on a routine basis, the Permittee shall at least once per month, bleed off the gas in the annulus and bring the annulus to a full, fluid-filled volume. The annulus pressure shall be constantly maintained above 100 psi.
- 3) The Permittee shall operate WDW-5 Central according to the following parameters:

<b>Maximum Surface Injection Pressure</b>	1,110 psi
<b>Maximum Rate of Injection</b>	290 gpm
<b>Maximum Monthly Injection Volume</b>	12,702,000 gal/30-day-month*

\* equivalent to 290 gpm over 365 days/12 months

4) The Permittee shall operate WDW-6 Central according to the following parameters:

<b>Maximum Surface Injection Pressure</b>	1,110 psi
<b>Maximum Rate of Injection</b>	290 gpm
<b>Maximum Monthly Injection Volume</b>	12,702,000 gal/30-day-month*

\* equivalent to 290 gpm over 365 days/12 months

I. Instrumentation

The Permittee shall ensure that the well head monitoring instrumentation is properly installed and maintained at all times.

J. Measured Parameters

In accordance with 40 CFR §146.13(b)(2), the Permittee shall install and use continuous monitoring devices, and shall install and use automatic alarm systems. Automatic alarm systems shall be designed to sound and shut-in the well when pressures or flow rates exceed permitted operating conditions. The following parameters shall be measured with an appropriate continuous recording device or devices housed in a weatherproof enclosure at the well head:

- 1) Injection tubing pressure, annulus pressure, flow rate, injection volume, temperature of injected fluids, pH; and
- 2) Any other parameters as requested by the Department or as specified by this permit.

**2. MECHANICAL INTEGRITY**

The Permittee shall maintain mechanical integrity of the injection wells at all times in accordance with 40 CFR §146.8 and 40 CFR §146.13(b)(3). An injection well has mechanical integrity if there is no significant leak in the casing, tubing, or packer and there is no significant fluid movement upward out of the injection zone into the designated confining zone or USDWs through any vertical channels adjacent to the well bore.

A. Mechanical Integrity Requirements

Mechanical integrity shall be demonstrated annually and shall follow the ADEQ UIC Program Mechanical Integrity Testing Requirements for All Class I Injection Wells. The anniversary date of testing shall coincide with the initial date from drilling of the wells or a Department-approved date. The annual test requirement may be extended upon approval by the Department for a maximum of ninety (90) days past the anniversary date. All tests shall be completed prior to September 30 of each federal fiscal year. The following requirements are necessary to demonstrate mechanical integrity:

- 1) A yearly annulus pressure test (APT) to be witnessed by the Department or an authorized representative of the Department;
- 2) A yearly measurement of the pressure buildup in the injection zone, which includes shutting-in the well for a time sufficient to allow the pressure in the injection interval to reach equilibrium;

- 3) A radioactive tracer test (RAT) shall be conducted once every year to determine the presence or absence of fluid movement behind the well casing;
- 4) A temperature, noise, or other approved log shall be conducted at least once every five years to test for movement of fluid along the borehole unless the Department waives this requirement;
- 5) Casing inspection logs shall be conducted at least once every five years unless the Department waives this requirement due to well construction or other factors that limit the reliability of this test; and
- 6) Any other appropriate test approved by the Department may be used by the Permittee to evaluate mechanical integrity.
- 7) The Department may require tests (a), (b), (c), or (e) above whenever the well is worked over, the tubing is removed, the packer is replaced, or when any information is received by the Department that may indicate such tests may be warranted. The Permittee shall notify the Department and obtain approval prior to conducting any workover.
- 8) The Permittee shall submit results of any of the above tests, including an interpretive analysis of each test, to the Department within sixty (60) days of the date of completion of the tests.

**B. Annulus Pressure Testing**

An annulus pressure test (APT) for WDW-5 Central and WDW-6 Central shall be conducted at least once each year. An APT shall be conducted after each workover involving tubing removal and/or packer placement, and after each well shut-down in excess of thirty (30) days. The test shall consist of pressuring the annulus to 100 psi above the maximum surface injection pressure, as specified in Part I.A.8.(c) of this permit, and holding that pressure for one hour with a maximum allowable pressure deviation of three percent (3%) of the initially recorded test pressure.

**C. Loss of Mechanical Integrity**

- 1) If a loss of mechanical integrity occurs during testing or during well operations, the Permittee shall do the following:
  - (a) Cease injection immediately;
  - (b) Take all steps necessary to determine if a release of waste into any unauthorized zones occurred;
  - (c) Notify the Department within twenty-four (24) hours after the loss of integrity was discovered and when injection is expected to resume; and
  - (d) Restore and demonstrate mechanical integrity to the satisfaction of the Director prior to resuming injection.
  - (e) Approval by the Department is required prior to any workover.

- 2) In accordance with Part II.F.17. of this permit, if there is evidence of a release of waste into an unauthorized zone, the Permittee shall:
  - (a) Immediately cease injection of fluids;
  - (b) Notify the Department within twenty-four (24) hours after discovery;
  - (c) Take all necessary steps to characterize the extent of the release;
  - (d) Comply with and implement a remediation plan required by the Department;
  - (e) Where such a release is into a USDW serving as a water supply, publish a notice in a newspaper of general circulation; and
  - (f) Where such a release is into a USDW, conduct ground water monitoring, as described in Part I.C.6. of this permit.

The Department may allow the Permittee to resume injection prior to completing the remediation action, provided that the Permittee is able to demonstrate that the injection operation will not endanger a USDW.

### 3. **MONITORING AND REPORTING**

#### A. Monthly Reporting Requirements

The Permittee shall compile Monthly Reports containing the following information:

- 1) Results of continuous monitoring, including:
  - (a) The monthly maximum, minimum, and average injection pressure;
  - (b) The monthly maximum, minimum, and average injection flow rate;
  - (c) The total injection volume for the month;
  - (d) The maximum, minimum, and average annulus pressure for the month;
  - (e) The maximum, minimum, and average pH of the injected waste stream for the month;
  - (f) The average daily specific gravity measurements.
- 2) The Monthly Reports shall be submitted as part of the Quarterly reports to the Department.

#### B. Quarterly Reporting Requirements

- 1) The Permittee shall submit Quarterly Reports to the Department, within twenty (20) days after the end of each quarter, as described in 40 CFR §146.13(c). These Quarterly Reports shall contain the following information:

- (a) The Monthly Reports specified in Part I.C.1. of this permit;
  - (b) Documentation of all noncompliance incidents or exceedances of operating parameters, violations, excursions, equipment malfunctions or events triggering an alarm or shut-down device, workovers, well testing, well stimulations and any other pertinent information concerning well operations during the quarter; and
- 2) These reports may be submitted electronically via email or may be submitted on a compact disk or similar recording media. With either method, the cover letter with original signature shall be scanned for compliance with the signatory requirements of Part II.F.14. of this permit.
  - 3) Any noncompliance incident, exceedances, or other violation as described in Part I.C.2.(a)(2) of the permit shall be reported within twenty-four (24) hours and include information required in Part II.F.17.(f)(2) of this permit.

**C. Annual Reporting Requirements**

The Permittee shall submit an Annual Report, due by March 1 of the following year, to the Department that contains the following information:

- 1) Results of continuous monitoring, including:
  - (a) The maximum, minimum, and yearly average of the injection pressure;
  - (b) The maximum, minimum, and yearly average of the injection flow rate;
  - (c) The maximum, minimum, and yearly average of the annulus pressure;
  - (d) The maximum, minimum, and yearly average for the pH of the injected waste stream;  
and
  - (e) The total injection volume for the year and since injection commenced for the well.
- 2) Documentation of all noncompliance incidents, violations, excursions, equipment malfunctions, and/or any other pertinent information concerning well operations;
- 3) A narrative covering all aspects of well operations for the year, including discussions of, and reasons for, any excursions from permitted operational parameters, any violations, and actions taken to correct the violation(s);
- 4) Discussion of any tests done to ensure the mechanical integrity of the well during the year, including the dates and times of those tests and certification by the Permittee that the well has demonstrated mechanical integrity;
- 5) The results and dates of any other tests performed on the well such as workovers or acid stimulations;

- 6) A direct measurement of bottom-hole pressure or a calculation of bottom-hole pressure using the specific gravity of the fluid in the well and the static fluid level, discussion of pressure effects of disposal operations upon the injection zones and specific injection intervals, and calculation of pressure build-up within the injection intervals;
- 7) An estimation of the distance from the well to the front of the injected fluids;
- 8) To the extent such information is reasonably available, the report shall also include:
  - (a) Locations of newly constructed and discovered wells within the zone of endangering influence or cone of influence;
  - (b) Data for all newly constructed and discovered wells that penetrate, or penetrate to within, 300 feet of the top of the injection zone that are located within a two (2) mile radius of WDW-5 Central and WDW-6 Central.
- 9) Results of corrosion monitoring, as specified in Part I.C.4. of this permit;
- 10) Results of the waste stream analysis as described in Part I.C.5. of this permit;
- 11) Ground water monitoring data as described in Part I.C.6. of this permit; and
- 12) These reports may be submitted electronically via email or may be submitted on a compact disk or similar recording media. With either method, the cover letter with original signature shall be scanned for compliance with the signatory requirements of Part II.F.14. of this permit.

D. Corrosion Monitoring

Upon a wellhead leak, annulus failure, casing leak, or other mechanical integrity failure that causes or may cause the well construction materials to fail, the Permittee shall prepare a plan for corrosion monitoring of the well materials. The monitoring program shall consist of the following:

- 1) The Permittee shall demonstrate that the waste stream will be compatible with the well materials in which it will be in contact and shall submit the methodology used in making that determination to the Department in accordance with §146.68(c)(2). For purposes of this requirement, compatibility is established if contact with the waste fluids will not cause the well materials to fail to satisfy any design requirement imposed under 40 CFR §146.65(b).
- 2) The Permittee shall be required to initiate continuous corrosion monitoring of the construction materials used in the well. Such a test may include the following:
  - (a) Placing coupons of well construction materials in contact with the waste stream;
  - (b) Routing the waste stream through a loop of well construction materials; or
  - (c) Using an alternative method approved by Department.
- 3) The Permittee shall monitor the materials for loss of mass and thickness, cracking, pitting, or any other signs of corrosion on a quarterly basis to ensure the well components meet the



minimum standards set forth in 40 CFR §146.65(b). Results of corrosion monitoring shall be submitted to Department with the Annual Reports, as described in Part I.C.3. of this permit.

**E. Waste Fluid Analysis**

Records of monitoring information shall include the location, time of sampling or measurements, the individual(s) who performed the sampling or measurements, the date(s) analyses were performed, the analytical techniques or methods used, the results of such analyses, and any other information required by the Department, in accordance with the approved Waste Analysis Plan (WAP) and 40 CFR §146.13(b)(1).

1) **Waste Analysis Plan**

The Permittee shall monitor the injected waste stream on a quarterly basis, in accordance with a Waste Analysis Plan (WAP) that describes the procedures and methods used to obtain a representative result of the waste stream. The WAP shall be submitted to the Department for approval prior to implementation. The WAP should include, at a minimum the following:

- (a) The parameters used to analyze the waste and reason for selecting these parameters;
  - (b) The test methods used for these parameters;
  - (c) The sampling method used to obtain a representative sample; and
  - (d) The location where the sample is to be taken.
- 2) The Permittee shall conduct sampling on the waste stream when a process change occurs at the plant that could result in the waste stream being altered. The Permittee shall ensure that the WAP remains current and accurate, and shall make updates or changes when the Department requires modification to keep the analysis representative of the waste stream.

**F. Ground Water Monitoring Program**

Upon annulus failure, casing leak, or other mechanical integrity failure that causes or may cause a release into or between a USDW, the Permittee shall prepare a plan for monitoring of the ground water quality in the USDW. Ground water monitoring shall be required in order to assure that injected fluids are not moving into or between any USDWs as described in 40 CFR §146.13(b)(4). The monitoring program shall consist of the following:

- 1) Appropriate sampling frequency of quarterly or semi-annually, as determined by the Department;
- 2) Monitoring parameters shall consist of the same program for waste stream analysis as described in the Waste Analysis Plan in Part I.C.5. of this permit;
- 3) Newly installed monitor wells or nearby water supply wells constructed at appropriate depths may be used for this purpose; and
- 4) Other conditions as may be required by the Department.

#### 4. CLOSURE

WDW-5 Central and WDW-6 Central shall be plugged in a manner which shall prohibit the movement of fluids into or between USDWs in accordance with 40 CFR §144.51(o) and §146.10. The Permittee shall prepare, maintain, and comply with the plugging and abandonment plan as submitted with the permit application. The plan shall be a condition of this permit. The obligation to implement the plan survives the termination of the permit or cessation of injection activities.

##### A. Final Abandonment

Upon final abandonment, the Permittee shall ensure that WDW-5 Central and WDW-6 Central are plugged in accordance with the approved plugging and abandonment plan submitted with the permit application and approved by Department.

##### B. Changes to the Plugging and Abandonment Plan

The Permittee shall submit to the Department any modifications to the plugging and abandonment and must demonstrate that the changes will provide protection equivalent to or greater than the original design criteria and standards. Any change to a plugging and abandonment plan shall be treated as a minor modification of the permit in accordance with 40 CFR §144.41(g) and must be approved by Department.

##### C. Financial Assurance

The Permittee shall assure financial responsibility as required in 40 CFR §144.52(a)(7) and Part I.E. of this permit.

##### D. Closure Plan

The plugging and abandonment plan shall include but not be limited to the following:

- 1) Cementing plan, including stages of cement circulation and methods;
- 2) Elevations of cement plugs;
- 3) Type and quantity of cement and other materials to be used for plugging;
- 4) Proposed tests or other measures;
- 5) Amount, size, and location of casing to remain in the well;
- 6) Procedure to be used to meet the requirements of Part I.D.7. of this permit;
- 7) Estimated cost of closure; and
- 8) Other information as required by Department.

E. Temporary Halt of Injection

- 1) The Permittee may temporarily cease injection in WDW-5 Central and/or WDW-6 Central provided the Permittee has received authorization from the Department and has described the actions or procedures taken to ensure that WDW-5 Central and/or WDW-6 Central will not endanger USDWs during the temporary period of disuse. The Permittee shall also comply with the terms and conditions of this permit during that period of disuse.
- 2) If WDW-5 Central and/or WDW-6 Central have ceased operations for more than two (2) years, the Permittee shall notify the Department prior to resuming injection activities and shall be required to perform a demonstration of mechanical integrity as described in Part I.B. of this permit. The Permittee shall be required to implement the closure plan as described in Part I.D.4. of this permit at the end of the two (2) years unless granted other approval by the Department.

F. Notice of Intent to Close

The Permittee shall notify the Department sixty (60) days prior to commencement of closure. The Permittee shall give notification of the intent to plug at least seventy-two (72) hours prior to the commencement of actual plugging operations.

G. Standards for Well Closure

- 1) The mechanical integrity of the well shall be verified prior to plugging and approved by the Department through the methods described in Part I.B. of this permit.
- 2) The pressure decay shall be observed and recorded for a time specified by the Department.
- 3) The well shall be flushed with a buffer fluid.
- 4) The well shall be plugged with cement in a manner that will not allow the movement of fluids into or between USDWs by circulating from total depth to the surface. The cement must be tagged and pressure tested before closure in a manner specified by the Department.

H. Closure Report

Within sixty (60) days after closure, the Permittee shall submit a Closure Report detailing the plugging and abandonment procedures. The Closure Report shall be certified as accurate by the person who performed the closure operation and must consist of a statement that the well was closed in accordance with the plugging and abandonment plan previously submitted and approved, or when the actual closure differed from the plan, a statement specifying the differences between the plan and the actual closure activities. The Closure Report shall, at a minimum, include the following:

- 1) Pressure in the injection zone prior to injection activities;
- 2) Measured bottom-hole pressure in the injection zone at the time of closure;

- 3) Predicted time until the pressure in the injection zone decays to the point that the cone of influence resulting from injection into WDW-5 Central and/or WDW-6 Central no longer intersects the base of the lowermost USDW;
- 4) Predicted position of the waste fluid front at the time of closure;
- 5) Discussion of the verification of mechanical integrity; and
- 6) Other information as required by the Department.

I. Post-Closure Care

The Permittee shall prepare, maintain, and comply with a plan for post-closure care if corrective action as described in Part II.I. of this permit is required. The obligation to implement the post-closure plan survives the termination or cessation of injection activities. The plan shall be submitted to the Department with the Notice of Intent to Close, as stated in Part I.D.6. of this permit and shall become a condition of this permit upon approval by the Department. Any revision or modification to the post-closure care plan must be submitted to and approved by the Department prior to the submission of the closure report as specified in Part I.D.8. of this permit. The Permittee shall also assure financial responsibility in accordance with Part I.E. of this permit. The plan shall include the following:

- 1) Status of any corrective action required in accordance with Part II.I. of this permit;
- 2) Estimated cost of the proposed post-closure care;
- 3) Procedures for conducting any ground water monitoring until the pressure in the injection zone decays to the point that the cone of influence resulting from injection into WDW-5 Central and/or WDW-6 Central no longer intersects the base of the lowermost USDW;
- 4) Submission of a survey plat to the local zoning authority and the Department which indicates the location of WDW-5 Central and/or WDW-6 Central relative to permanently surveyed benchmarks;
- 5) Notification to the Arkansas Oil and Gas Commission or other agencies that have authority over other drilling activities to enable such agency or agencies to impose conditions over such drilling activities that may penetrate WDW-5 Central and/or WDW-6 Central injection or confining zones;
- 6) Retention of all records for a period of three (3) years following closure;
- 7) Recording a deed notation or some other instrument that will provide any potential purchaser the information that the location has been used to manage non-hazardous waste fluids; and
- 8) Other information as required by the Department.

## 5. FINANCIAL ASSURANCE

The Permittee shall establish financial assurance for the plugging and abandonment of WDW-5 Central and/or WDW-6 Central through the mechanisms described in 40 CFR Part 144 Subpart F.

### A. Cost Estimate

- 1) The Permittee must prepare a written cost estimate, in current dollars, of the cost of plugging and abandoning WDW-5 Central and/or WDW-6 Central in accordance with the plugging and abandonment plan as specified in Part I.D. of this permit. The plugging and abandonment cost estimate must equal the cost of plugging and abandonment at the point in the facility's operating life when the extent and manner of its operation would make plugging and abandonment the most expensive, as indicated by the plugging and abandonment plan.
- 2) The Permittee must adjust the plugging and abandonment cost estimate for inflation within thirty (30) days after each anniversary date on which the first plugging and abandonment cost estimate was prepared. The adjustment must be made in accordance with the requirements of 40 CFR §144.62(b). The Permittee must also revise the plugging and abandonment cost estimate whenever a change in the plugging and abandonment plan increases the cost of the plugging and abandonment activities.

### B. Options for Financial Assurance

The Permittee must establish financial assurance through the mechanisms described in 40 CFR §144.63(c), §144.63(d), and §144.63(f).

#### 1) Surety Bond

The Permittee shall submit a surety bond guaranteeing performance of plugging and abandonment to the Director in accordance with 40 CFR §144.63(c)(1). One (1) original signed copy shall be submitted. The bond shall be effective prior to the Director granting written approval for injection to commence. The surety company must be among those listed as acceptable sureties on the Federal bonds in Circular 570 of the U.S. Department of Treasury. The Department will supply the necessary copies to the Permittee for signature that follows the wording described in 40 CFR §144.70(c).

#### 2) Plugging and Abandonment Letter of Credit

The Permittee shall submit a letter of credit guaranteeing an amount at least equal to the current plugging and abandonment cost estimate as described in 40 CFR §144.63(d) and follows the wording described in 40 CFR §144.70(d). A standby trust fund shall also be established, in accordance with 40 CFR §144.63(d)(3).

#### 3) Financial Test and Corporate Guarantee

The Permittee shall pass a financial test and meet the criteria of 40 CFR §144.63(f)(1)(i) or (f)(1)(ii). If the Permittee meets these criteria, the Permittee shall submit a letter to the Director which is signed by the Permittee's chief financial operator and worded as specified in 40 CFR

§144.70(f) and to include the items required by 40 CFR §144.63(f). The Permittee shall submit updated information within ninety (90) days after the close of each succeeding fiscal year.

The Permittee shall secure and maintain in full force and effect at all times a financial assurance mechanism, in a form acceptable to the ADEQ, to provide for the proper closure, plugging and abandonment of WDW-5 Central and/or WDW-6 Central. This permit does not authorize underground injection of fluids into WDW-5 Central and/or WDW-6 Central unless the Permittee has submitted an in-effect acceptable financial assurance mechanism acceptable to the ADEQ.

C. Post-Closure Care

The Permittee shall demonstrate and maintain financial assurance for post-closure care by using the appropriate mechanism specified in 40 CFR Part 144 Subpart F and Part I.E.2. of this permit. The amount shall be no less than the amount specified in Part I.E.1. of this permit. The obligation to maintain financial responsibility for post-closure care survives the termination of the permit or cessation of injection.

**PART II**  
**STANDARD CONDITIONS**

**GENERAL CONDITIONS**

**1. Duty to Comply**

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Arkansas Water and Air Pollution Control Act (Act 472 of 1949 as amended) and is grounds for enforcement civil and administrative enforcement action, for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

**2. Penalties for Violations of Permit Conditions**

The Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended) provides that any person who violates any provisions of a permit issued under the Act shall be guilty of a misdemeanor and upon conviction thereof shall be subject to imprisonment for not more than one (1) year, or a fine of not more than twenty-five thousand dollars (\$25,000) or by both such fine and imprisonment for each day of such violation. Any person who violates any provision of a permit issued under the Act may also be subject to civil penalty in such amount as the court shall find appropriate, not to exceed ten thousand dollars (\$10,000) for each day of such violation. The fact that any such violation may constitute a misdemeanor shall not be a bar to the maintenance of such civil action.

**3. Permit Actions**

- A. This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to the following:
- 1) Violation of any terms or conditions of this permit;
  - 2) Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
  - 3) A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination;
  - 4) Failure of the permittee to comply with the provisions of APCEC Regulation No. 9 (Permit fees)
- B. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

**4. Civil and Criminal Liability**

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of this permit or applicable state statutes or regulations which defeats the regulatory purposes of the permit may subject the permittee to criminal enforcement pursuant to the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended).

**5. Oil and Hazardous Substance Liability**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act and Section 106 of CERCLA.

**6. State Laws**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties established pursuant to any applicable State law or regulation.

**7. Property Rights**

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

**8. Severability**

The provisions of this permit are severable, and if any provision of this permit, or the application of any provisions of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

**9. Permit Fees**

The permittee shall comply with all applicable permit fee requirements for no discharge permits as described in APCEC Regulation No. 9 (Regulation for the Fee System for Environmental Permits). Failure to promptly remit all required fees shall be grounds for the Director to initiate action to revoke this permit.

**10. Proper Operation and Maintenance**

- A. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
- B. The permittee shall provide an adequate operating staff which is duly qualified to carryout operation, maintenance and testing functions required to insure compliance with the conditions of this permit.



11. **Duty to Mitigate**

The permittee shall take all reasonable steps to prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment, or the water receiving the discharge.

12. **Removed Substances**

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of waste waters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering the waters of the State.

13. **Reporting of Violations and Unauthorized Discharges**

Any violations to this permit must be reported to the Enforcement Branch of the Department immediately. Any leaks or seeps shall be reported to the Department and appropriately corrected. Any discharge from the waste storage system such as an overflow, a broken pipe, etc., shall be immediately reported to the Department.

The operator shall visually monitor and report immediately (within 24 hours) to the Enforcement Branch any unauthorized discharge from any facility caused by dike or structural failure, equipment breakdown, human error, etc., and shall follow up with a written report within five (5) days of such occurrence. The written report shall contain the following:

- i. A description of the permit violation and its cause;
- ii. The period of the violation, including exact times and dates;
- iii. If the violation has not been corrected, the anticipated time it is expected to correct the violation; and
- iv. Steps taken or planned to reduce, eliminate, and prevent the recurrence of the violation.

Reports shall be submitted to the Enforcement Branch at the following address:

Arkansas Department of Environmental Quality  
Water Division, Enforcement Branch  
5301 Northshore Dr.  
North Little Rock, Arkansas 72118  
Fax (501) 682-0910

14. **Penalties for Tampering**

The Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended) provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under the Act shall be guilty of a misdemeanor and upon conviction thereof shall be subject to imprisonment for not more than one (1) year or a fine of not more than ten thousand dollars (\$10,000) or by both such fine and imprisonment.

**15. Retention of Records**

The permittee shall retain records of all monitoring information, copies of all reports required by this permit, and records of all data used to complete the application for this permit for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

**16. Record Contents**

Records and monitoring information shall include:

- a. The date, exact place, time and methods of sampling or measurements, and preservatives used, if any;
- b. The individual(s) who performed the sampling or measurements;
- c. The date(s) analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques or methods used; and
- f. The measurements and results of such analyses.

**17. Inspection and Entry**

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

- (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- (b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- (c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit,
- (d) Sample, inspect or monitor at reasonable times, for the purposes of assuring permit compliance any substances or parameters at any location.

**18. Planned Changes**

The permittee shall give notice and provide the necessary information to the Director for review and approval prior to any planned physical alterations or additions to the permitted facility.

**19. Anticipated Noncompliance**

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

**20. Transfers**

The permit is nontransferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act.

**21. Duty to Provide Information**

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit. Information shall be submitted in the form, manner and time frame requested by the Director.

**22. Duty to reapply**

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The complete application shall be submitted at least 180 days before the expiration date of this permit. The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date. Conditions of this permit will continue in effect past the expiration date pending issuance of a new permit, if:

- (1) The permittee has submitted a timely and complete application; and
- (2) The Director, through no fault of the permittee, does not issue a new permit prior to the expiration date of the previous permit.

**23. Signatory Requirements**

All applications, reports or information submitted to the Director shall be signed and certified. All permit applications shall be signed as follows:

- a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
  - (a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation: or
  - (b) The manager of one or more manufacturing, production, or operation facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- b. For a partnership or sole proprietorship: by a general partner or proprietor, respectively; or
- c. For a municipality, State, Federal, or other public agency; by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:
  - (a) The chief executive officer of the agency, or
  - (b) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person.

A person is a duly authorized representative only if:

- a. The authorization is made in writing by a person described above.
- b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- c. The written authorization is submitted to the Director.

Certification. Any person signing a document under this section shall make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

**24. Availability of Reports**

Except for data determined to be confidential under APCEC Regulation 6, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department of Environmental Quality. As required by the Regulations, the name and address of any permit applicant or permittee, permit applications, permits and effluent data shall not be considered confidential.

**25. Penalties for Falsification of Reports**

The Arkansas Air and Water Pollution Control Act provides that any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained under this permit shall be subject to civil penalties and/or criminal penalties under the authority of the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended).

**26. Applicable Federal, State, or Local Requirements**

Permittees are responsible for compliance with all applicable terms and conditions of this permit. Receipt of this permit does not relieve any operator of the responsibility to comply with any other applicable federal, state or local statute, ordinance policy, or regulation.

**PART III  
DEFINITIONS**

“**Act**” means the Arkansas Water and Air Pollution Control Act, as amended, Ark. Code Ann. § 8-4-101 *et seq.*) as amended.

“**Applicable water quality standards**” means all water quality standards to which a discharge is subject under the federal Clean Water Act and which has been (a) approved or permitted to remain in effect by the Administrator following submission to the Administrator pursuant to Section 303 (a) of the Act, or (b) promulgated by the Director pursuant to Section 303(b) or 303(c) of the Act, and standards promulgated under APC&EC Regulation No. 2, as amended, (Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas.)

“**Department**” means the Arkansas Department of Environmental Quality (ADEQ).

“**Director**” means the Director of the Arkansas Department of Environmental Quality.

“**APC&EC**” means the Arkansas Pollution Control and Ecology Commission.

“**APT**” means Annulus Pressure Test

“**bkb**” means below kelly bushing

“**Brine**” means salt brines of the Smackover Formation (Oxfordian, Upper Jurassic) in south-central Arkansas. Bromine is present in extremely high concentrations in this brine.

“**Debrominated brine**” means salt brines that have had the bromine extracted from them. This is also commonly called tail brine.

“**CFR**” means Code of Federal Regulations.

“**DL**” means Detection Limits

“**gpm**” means gallons per minute

“**MIT**” means Mechanical Integrity Test

“**PQL**” means Practical Quantitation Limits.

“**psi**” means pounds per square inch

“**RAT**” means Radioactive Tracer Test

“**SDWA**” means the Safe Drinking Water Act

“**Severe property damage**” means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in products.

“**s.u.**” means standard units.

“**UIC**” means Underground Injection Control.

“**USDW**” means Underground Source of Drinking Water.

“**WDW**” means Waste Disposal Well.

**MONTHLY:**

is defined as a calendar month or any portion of a calendar month for monitoring requirement frequency of once/month or more frequently.

**QUARTERLY:**

(1) is defined as a fixed calendar quarter or any part of the fixed calendar quarter for a non-seasonal effluent characteristic with a measurement frequency of once/quarter. Fixed calendar quarters are: January through March, April through June, July through September, and October through December; or

(2) is defined as a fixed three month period (or any part of the fixed three month period) of or dependent upon the seasons specified in the permit for a seasonal effluent characteristic with a monitoring requirement frequency of once/quarter that does not does not coincide with the fixed calendar quarter. Seasonal calendar quarters are: May through July, August through October, November through January, and February through April.

**SEMI-ANNUAL:**

is defined as the fixed time periods January through June, and July through December (or any portion thereof) for an effluent characteristic with a measurement frequency of once/6 months or twice/year.

**ANNUAL or YEARLY:**

is defined as a fixed calendar year or any portion of the fixed calendar year for an effluent characteristic or parameter with a measurement frequency of once/year. A calendar year is January through December, or any portion thereof.

## STATEMENT OF BASIS

This statement of basis is for information and justification of the permit limits and is not enforceable. This permit decision is for the renewal of a no-discharge operation under permit number 0011-UR- and AFIN 70-00012.

### 1. PERMITTING AUTHORITY

Arkansas Department of Environmental Quality  
Water Division, Permits Branch  
5301 Northshore Dr.  
North Little Rock, Arkansas 72118-5317

### 2. APPLICANT

Great Lakes Chemical Corporation, A Chemtura Company  
2226 Haynesville Highway  
El Dorado, AR 71730  
870-862-5141

### 3. FACILITY LOCATION

The facilities are located as follows: From Highway 82 at Highway 15 (Haynesville Highway) in El Dorado, take Highway 15 southwest 2.6 miles to Union County Road 401 (Feed Mill Road) on right, then 0.5 mile to gravel road on left to WDW-5 Central well site in Section 2, Township 18 South, Range 16 West, in the community of Parkers Chapel, Union County, Arkansas. The facility is located at the following coordinates: Latitude: 33° 10' 13" North, Longitude: 92° 44' 42" West

From Highway 82 at Highway 15 (Haynesville Highway) in El Dorado, take Highway 15 southwest 2.1 miles to gravel road on right just before ball park, then 0.5 mile to WDW-6 Central well site in Section 11, Township 18 South, Range 16 West, in the community of Parkers Chapel, Union County, Arkansas. The facility is located at the following coordinates: Latitude: 33° 8' 58" North, Longitude: 92° 45' 23" West

### 4. RECEIVING STREAM LOCATION

The facilities are located at least 323 feet and 556 feet from a tributary to Dry Creek in Stream Segment 2E of the Ouachita River basin.

### 5. CONSULTANT FOR THIS FACILITY

Philip R. Grant, Senior Geologist  
Terra Dynamics, Inc.  
4616 W. Howard Lane, Suite 9-980  
Austin, TX 78728

## 6. PREPARED BY

The permit was prepared by:

Linda Hanson, P.G.  
Geologist  
Permits Branch, Water Division  
501-682-0642  
E-mail: [hanson@adeq.state.ar.us](mailto:hanson@adeq.state.ar.us)

## 7. PREVIOUS PERMIT ACTIVITY

Previous Permit No.: 0011-U  
Effective Date: December 16, 1994  
Expiration Date: December 15, 2004

On March 31, 2010 the Letter of Credit was cashed in. \$987,500.00 was deposited into a trust fund according to ADEQ and EPA requirements to cover estimated closure costs for all Great Lakes Chemical Company/Chemtura's wells. The estimated closure costs were one hundred thousand dollars (\$100,000.00) each for WDW-5 Central and WDW-6 Central. On April 11, 2011, a statement was submitted to ADEQ listing the balance of the trust fund as of the close of business March 31, 2011 as \$987,713.56.

The Permittee submitted a permit renewal application which was received on June 14, 2004 with additional information submitted June 6, 2011. It is proposed that this no-discharge permit be issued for a 10-year term.

The Permittee submitted an irrevocable Standby Letter of Credit and associated Standby Trust for Underground Injection Control Wells (Number 608936041) dated March 28, 2007 in accordance with Part I.E.2.(b) of this permit, for the amount of two hundred thousand dollars (\$200,000.00) for injection wells WDW-5 Central and WDW-6 Central (\$100,000.00 each).

## 8. APPLICANT ACTIVITY

Under the standard industrial classification (SIC) code 2819, 2829, and 2879 or North American Industry Classification System (NAICS) code 325188, Industrial Organic Chemicals. This permit is for the operation of two UIC Class I hazardous waste injection wells.

## 9. BASIS FOR PERMIT CONDITIONS

The Arkansas Department of Environmental Quality has made a tentative determination to issue a permit for the no-discharge facility as described in the application and waste analysis plan. Permit requirements and conditions are based on regulations pursuant to 40 CFR Parts 124, 144, 145 and 146; the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 *et seq.*); and Regulation No. 17. Standard Conditions have been included in this permit based on generally accepted scientific knowledge, engineering practices and the authority of the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 *et seq.*).



## 10. PERMIT COMPLIANCE

Compliance is required on the effective date of the permit.

## 11. PERMIT HISTORY

Previous Permit 11-U was issued November 16, 1994 and was effective December 16, 1994 with an expiration date of December 15, 2004.

## 12. SOURCES

The following Sources were used to draft the permit:

- A. APC&EC Regulation No. 2, Water Quality Standards for Surface Waters of the State of Arkansas as amended.
- B. APC&EC Regulation No. 8, Administrative Procedures, as amended.
- C. APC&EC Regulation No. 9, Fee System for Environmental Permits, as amended.
- D. APC&EC Regulation No. 17, Arkansas Underground Injection Control (UIC) Code
- E. Integrated Water Quality and Assessment Report (305(b) Report)
- F. Arkansas Water and Air Pollution Control Act (Ark. Code Ann. § 8-4-101 *et seq.*)
- G. 40 CFR Parts 144, 145, 146 and 124
- H. Safe Drinking Water Act (SDWA)
- I. Application No. 0011-UR-1 received June 14, 2004.
- J. Annual Reports submitted prior to March 1 every year.
- K. Financial Assurance Standby Trust Fund documents received April 11, 2011.
- L. Bimonthly site inspections conducted annually since the issuance of the previous permit.
- M. Mechanical integrity testing conducted annually since the issuance of the previous permit.
- N. Waste Analysis Plan submitted June 6, 2011.
- O. The EPA approval of the exemption to land disposal restrictions for WDW-5 and WDW-6 at the GLS Central Plant facility dated August 31, 2011.
- P. The most recent site visit was dated February 8, 2012.